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Security Enhancement of Dynamic Signature by Utilizing Local Features with Individual Threshold

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Dynamic signature has potential to replace conventional signature in verifying an authorised person since it is legal and widely accepted by society. To date, most of the existing researches emphasise in obtaining a high performance of Genuine Acceptance Rate (GAR). However, at the same time, a high percentage of False Acceptance Rate (FAR) is achieved which indicates the verification system has a high-security vulnerability that exposes the signature being forged by an imposter. Therefore, this research aims to enhance the security level by fully utilising the advantages of all local features with the deployment of individual threshold in verifying a genuine signature. The features are based on time and strokes of the dynamic signature. The individual threshold is obtained during the training process to acquire an accurate verification setting for each signature to improve the performance of FAR. Subsequently, experiments are conducted using different classifiers including Neural Network (NN), Bayes Network and Linear Discriminant Analysis (LDA) and their outputs are measured using Genuine Acceptance Rate (GAR), False Rejection Rate (FRR) and False Acceptance Rate (FAR). The results showed that signature verification using individual threshold produced the highest GAR of 98.2%, the smallest FRR and FAR of 1.8% and 1.0% respectively, and outperformed the results with a common threshold. Thus, the proposed technique increased the security in signature verification with a lower error rate in FAR.

Keywords: Computational Intelligence, Dynamic Signature, Individual Threshold.

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